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मलाईरहित दूध पाउडर — विशिष्टि

भाग 1 मानक ग्रेड

(दूसरा पुनरीक्षण)

Skimmed Milk Powder — Specification

Part 1 Standard Grade

(Second Revision)

ICS 67.100.10

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Dairy Products and Equipment Sectional Committee, FAD 19

FOREWORD

This Indian Standard (Part 1) (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Dairy Products and Equipment Sectional Committee had been approved by the Food and Agriculture Division Council.

The milk production in our country is characterized by seasonal variations and drying of milk, an important method of preservation, facilitates later consumption during the lean season. The dried milk products, thus, have become an essential part of the chain between the producer and the consumer.

The standard covering the requirement both for skimmed milk powder, standard grade and extra grade, in two parts was first published in 1992. The standard for standard grade skimmed milk powder (Part 1) was first revised in 1998 to align with FSSAI requirements and modify packing details.

In this revision, requirement for milk protein in milk solids not fat and microbiological requirements like *E. coli*, coagulase positive *Staphylococcus aureus, Salmonella,* yeast and mould count, aerobic and anaerobic spore count and *Listeria monocytogenes* have been included to align the standard with the *Food Safety and Standards Regulations*, 2011. In addition, an alternate method for determination of fat in skimmed milk powder by Gerber method has been incorporated.

While formulating this standard, due consideration has been given to the *Food Safety and Standards (Food Products Standards and Food Additives) Regulations*, 2011 and *Legal Metrology (Packaged Commodities) Rules*, 2011. However, this standard is subject to restrictions imposed under these rules, wherever applicable.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SKIMMED MILK POWDER — SPECIFICATION

PART 1 STANDARD GRADE

(Second Revision)

1 SCOPE

This standard (Part 1) prescribes the requirements, methods of sampling and test for skimmed milk powder, standard grade.

2 REFERENCES

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated.

3 TERMINOLOGY

For the purpose of this standard, the following definition shall apply.

3.1 Skimmed Milk Powder, Standard Grade — The product obtained from skimmed milk of cow or buffalo or a combination thereof by the removal of water through spray drying or by roller drying.

4 DESCRIPTION

The product shall be white or white with greenish tinge to light cream in colour. It shall be free from lumps except those that break up readily under slight pressure.

5 REQUIREMENTS

5.1 Milk intended for production of skimmed milk powder shall be tested for its freedom from preservatives, neutralizers and adulterants [*see* IS 1479 (Part 1)].

5.2 The product shall be free from extraneous matter, added colour and added flavour.

5.3 The product may contain added calcium chloride, citric acid and sodium citrate, sodium salts of orthophosphoric acid and polyphosphoric acid (as linear phosphate), not exceeding 0.3 percent by mass of the finished product. Such addition need not be declared on the label.

5.4 The flavour of the product or of the reconstituted milk shall be pleasant and clean. It may have slightly cooked but not the burnt flavour. It is recommended that the flavour and taste may be judged on the basis of sensory characteristics (*see* IS 10030).

5.5 Hygienic Conditions

The product shall be manufactured and packed under hygienic conditions (*see* IS 2491)

5.6 The product shall also conform to the requirements given in Table 1 and Table 2.

Table 1 Requirements for Skimmed Milk Powder, Standard Grade

(*Clause* 5.6)

Sl No. (1)	Characteristics (2)	Requirements (3)	Method of Test, Ref to (4)
i)	Moisture, percent by mass, *Max*	4.0	IS 11623
ii)	Milk protein in milk solids not fat, percent by mass, *Min*	34.0	IS 7219
iii)	Milk fat, percent by mass, *Max*	1.5	IS 11721[1] or Annex B
iv)	Insolubility index, ml, *Max*	2	IS 12759
v)	Total ash (on dry basis), percent by mass, *Max*	8.2	Annex B of IS 14433
vi)	Titratable acidity, ml of 0.1 N NaOH/10 g of solids not fat	12–18	IS 11766
vii)	Scorched particles, mg, *Max*	15 (equivalent to Disc B)	IS 13500

[1] In case of dispute, the method indicated in IS 11721 shall be the reference method.

Table 2 Microbiological Requirements for Skimmed Milk Powder, Standard Grade

(*Clause* 5.6)

Sl No. (1)	Characteristics (2)	Sampling Plan[1] (3)	Requirements (4)	Method of Test, Ref to (5)
i)	Bacterial count, per g, *Max*	m	40 000	IS 5402
		M	50 000	
ii)	Coliform count per g	m	10	IS 5401 (Part 1)
		M	50	
iii)	*Escherichia coli*, per g	M	Absent	IS 5887 (Part 1)
iv)	Coagulase positive *Staphylococcus aureus*, per g, *Max*	m	–	IS 5887 (Part 2)
		M	10	
v)	*Salmonella*, per 25 g[2]	M	Absent	IS 5887 (Part 3)
vi)	Spore Count, per g			
	a)Aerobic (*Bacillus cereus*)	m	100	IS 5887 (Part 4)
		M	1 000	
	b) Anaerobic (*Clostridium perfringenes*)	m	10	IS 5887 (Part 6)
		M	100	
vii)	*Listeria monocytogenes*, per g	M	Absent	IS 14988 (Part 1)
viii)	Sampling Guidelines[1]	n	5	
		c	2 [for Sl No. (i), (ii) & (vi)] 0 [for Sl No. (iii), (iv), (v) & (vii])	
		Storage and transport	Ambient, *Max* 30ºC	

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[1] The sampling plan and sampling guidelines for microbiological testing to be followed for skimmed milk powder, standard grade is given in Annex C.

[2] The requirement for *Salmonella* shall be tested in a laboratory situated away from the production area.

6 PACKING AND MARKING

6.1 Packing

6.1.1 *Retail Packing*

The product shall be packed in clean and sound metal containers (*see* IS 11078) or in a food grade flexible pack made from a film or combination of any of the substrates made of board, paper, polyethylene, polyester metalized film or aluminium foil in such a way so as to protect it from deterioration. In the case of the plastic material, only food grade plastic (*see* IS 10171) shall be used.

NOTES

1 For food grade plastic material, sub-clause 2 of clause **2.1.1** of chapter 2 of *Food Safety and Standards (Packaging and Labelling) Regulationsi 201i1* should also be referred.

2 In the case of flexible pack, the following information shall be marked on the label:

'Once opened, the entire product content should immediately be placed in a clean air-tight container'.

6.1.1.1 The product shall be packed in quantities as stipulated under the provisions of the *Legal Metrology (Packaged Commodities) Rules*, 2011.

6.1.1.2 Further encasing of individual retail packs may be carried out in bags/cartons of adequate strength as outlined in **6.1.2.**

6.1.2 *Bulk Packing*

The product may be packed in quantities of 25 kg in bags of food grade polyethylene (*see* IS 10171) of minimum thickness 0.05 mm. The bags should be properly closed by tying with a string or a rubber band or heat sealed and shall be subsequently encased in any of the following:

a) Sacks conforming to IS 11824;
b) Multi-walled kraft paper, such as crepe kraft paper bags of not less than 80 g/m^2 (GSM) grade lined with Hessian cloth having a mass of 270 g/m^2 (GSM) and having two inner layers of plain kraft paper of not less than 80 g/m^2 (GSM) grade.

6.2 Marking

The package shall bear legibly and indelibly the following information:

a) Name and grade of the material and brand name, if any;
b) Name and address of the manufacturer;
c) Batch or Code No.;
d) Process of drying;
e) Month and year of manufacturing or packing;
f) Net quantity (*see* **6.1.1.1**);
g) Direction for storage;

h) Best before ....(month and year in capital letters);

OR

Best before........................ (months) from the date of packing/manufacture;

j) Direction for reconstitution;

k) The container contains equivalent of ....litre of skimmed milk;

m) Information given under Note 2 of **6.1.1**, if applicable; and

n) Any other requirements under the *Legal Metrology (Packaged Commodities) Rules*, 2011 and the *Food Safety and Standards (Food Products Standards and Food Additives) Regulations*, 2011.

6.2.1 *BIS Certification Marking*

The product may also be marked with the Standard Mark.

6.2.1.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian* Standards *Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

7 SAMPLING

The method of drawing representative samples of the material and criteria for conformity shall be as prescribed in IS 1165.

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
360 : 1964	Specification for amyl alcohol
1165 : 2002	Milk powder — Specification (*fifth revision*)
1479 (Part 1) : 1960	Methods of test for dairy industry: Part 1 Rapid examination of milk
2491 : 2013	Food hygiene — General principles — Code of practice (*third revision*)
5401 (Part 1) : 2002	Microbiology — General guidance for enumeration of coliforms : Part 1 Colony count technique (*first revision*)
5402 : 2002	General guidance for the enumeration of microorganisms — Colony count technique at 30°C (*first revision*)
5403 : 1999	Method for yeast and mould count of foodstuffs (*first revision*)
5887	Methods for detection of bacteria responsible for food poisoning:
(Part 1) : 1976	Isolation, identification and enumeration of *Escherichia coli*
(Part 2) : 1976	Isolation, identification and enumeration of *Staphylococcus Aureus* and faecal streptococci (*first revision*)
(Part 3) : 1999/ ISO 6579 : 1993	General guidance on methods for detection of *Salmonella* (*second revision*)
(Part 4) : 1999	Isolation, and identification of *Clostridium Perfringens* (*Clostridium Welchii*) and *Clostridium Botulinum* and enumeration *of Clostridium Perfringens* (*second revision*)
(Part 6) : 2012/ ISO 7932 : 2004	Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of presumptive Bacillus cereus : Part 6 Colony count technique at 30°C
7219 : 1973	Method for determination of proteins in food and feed ingredients
10030 : 1981	Method for sensory evaluation of milk powder
10171 : 1999	Guide on suitability of plastics for food packaging (*second revision*)
11078 : 1993	Specification for round open top sanitary cans for milk powder
11546 : 2012/ ISO 707 : 2008	Milk and milk products — Guidance on sampling (*first revision*)
11623 : 2008/ ISO 5537 : 2004	Dried milk — Determination of moisture content (reference method)
11721 : 2005	Dried milk and dried milk products — Determination of fat content — Gravimetric method (reference method) (*first revision*)
11766 : 1986	Method for determination of titratable acidity in milk powder and similar products
11824 : 1986	Paper coated high density

IS No.	*Title*
	polyethylene woven sacks for packing skim milk powder
12759 : 1989	Dried milk and dried milk products — Determination of insolubility index
13500 : 1992	Spray dried milk powders — Scorched particles — Determination
14433 : 2007	Infant milk substitutes — Specification (*first revision*)
14988 (Part 2) : 2002/ ISO 11290-2 : 1998	Microbiology of food and animal feeding stuffs — Horizontal method for detection and enumeration of *Listeria monocytogenes*: Part 2 Enumeration method

ANNEX B

[*Table* 1, *Sl No.* (iii)]

DETERMINATION OF FAT IN SKIMMED MILK POWDER ROUTINE METHOD

B-1 REAGENTS

B-1.1 Gerber Sulphuric Acid — Sulphuric acid shall have a density of 1.807 to 1.812 g/ml at 27°C corresponding with a concentration of sulphuric acid from 90 to 91 percent by mass.

B-1.2 Amyl Alcohol — The amyl alcohol shall conform to Grade 1 of IS 360.

B-2 PROCEDURE

Take 10 ml of gerber acid into milk butyrometer. Weigh 1 g of skimmed milk powder in a 50 ml beaker and dissolve it in little amount of distilled water and transfer carefully into the milk butyrometer. Add 1 ml of amyl alcohol with the help of tilt measure. Make up the volume in butyrometer by adding distilled water. Close the butyrometer with rubber-stopper and mix the contents by shaking until the entire sample has been digested.

Place the butyrometer in the centrifuge, balance the machine and centrifuge for 5 min. Transfer the butyrometer in water bath at 65 ± 2ºC for 5 min.

Adjust the fat column within the scale and take reading.

B-3 CALCULATION

Milk fat, percent by mass = Butyrometer reading × 10

ANNEX C

(*Table* 2)

SAMPLING PLAN AND SAMPLING GUIDELINES FOR MICROBIOLOGICAL TESTING OF SKIMMED MILK POWDER

C-1 SAMPLING GUIDELINES

The sampling for different microbiological testing parameters proposed in the standards is to be ensured aseptically by a trained person at manufacturing units following guidelines given in IS 11546. The samples shall be stored and transported under appropriate temperature conditions and insulations within 24 h of sampling to accredited laboratory for analysis as per the approved test methods. A large sample size may be drawn (if desired) according to the tests required and the type of product. Preservatives shall not be added to samples intended for microbiological examination. Three sample sets shall be taken from full production batches. Each sample set shall comprise of a minimum of five samples of 100 g each taken randomly from throughout the batch. The samples will be submitted to the laboratory in the original unopened packaging, sealed at the time of sampling maintained in their original physical state. A set of five samples shall be tested from three different accredited laboratories and the final decision shall be drawn based on three test results. There will be no provision for retesting or re-sampling for microbiological testing.

C-2 SAMPLING PLAN AND INTERPRETATION

The following terms, as used by the International Commission on Microbiological Specifications of Foods (ICMSF) are defined and used in the standard:

n = the number of sample units which must be examined from the batch/lot of food to satisfy the requirements of a particular sampling plan.

c = the maximum allowable number of defective sample units. This is the number of sample units, which may exceed the microbiological limit specified by m. These are considered marginally acceptable results provided they did not exceed the limit specified by M. When more than this number is found; the lot is rejected by the sampling plan.

m = represents an acceptable level and values above it are marginally acceptable in terms of the sampling plan.

M = a microbiological criterion which separates marginally acceptable quality from unsatisfactory/potentially hazardous quality. Values above M are unacceptable in terms of the sampling plan and detection of one or more samples exceeding this level would be cause for rejection of the lot.

When 5 or more units of the same variety from a lot or consignment are analyzed ($n = 5$), no more than 2 units ($c = 2$) should exceed the maximum tolerance (m) for microbiological levels stated in the reference criteria and no 1 unit should exceed the stated level for the maximum tolerance (M). Microbiological criteria and their interpretation: Three categories of microbiological quality have been assigned in standard based on total plate count, levels of indicator organisms (coliform count and yeast and mould count) and the number or presence of pathogenic bacteria. These are satisfactory, unsatisfactory and potentially hazardous.

a) Satisfactory: if a maximum of c/n value are between m and M, and the rest of the values observed are $< m$ — means the results are within limits of acceptable microbiological quality and no action is required.

b) Unsatisfactory: if one or more of the observed values linked with hygiene indicators (total plate count, coliform count and yeast and mold count) are $> M$ or more than 'c' values are between m and M — it means the results are outside acceptable microbiological limits and are indicative of poor hygiene or poor handling practices. Efforts should be initiated to bring these values to satisfactory level.

c) Potentialy hazardous: if one or more of the observed values linked with pathogenic bacteria (*Escherichia. coli, Salmonella, coagulase positive Staphylococcus aureus, Bacillus cereus, Clostridium. perfringens, L. monocytogenes*) are $> M$ or more than 'c' values are between m and M — it means the results are outside acceptable microbiological limits and are indicative of serious food safety concern and immediate remedial action should be initiated. Withdrawal of any of the food still available for sale or distribution and if applicable, recall action may be initiated. An investigation of food production or handling practices shall be investigated to determine the source/cause of the problem so that remedial action can commence. A detailed risk assessment shall also be done.

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Amendments Issued Since Publication

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